



Center for Western Weather  
and Water Extremes

SCRIPPS INSTITUTION OF OCEANOGRAPHY  
AT UC SAN DIEGO

# CW3E S2S Outlook: 25 Jan 2022

*Prepared by: C. Castellano, J. Wang, M. DeFlorio, J. Kalansky*

UC San Diego



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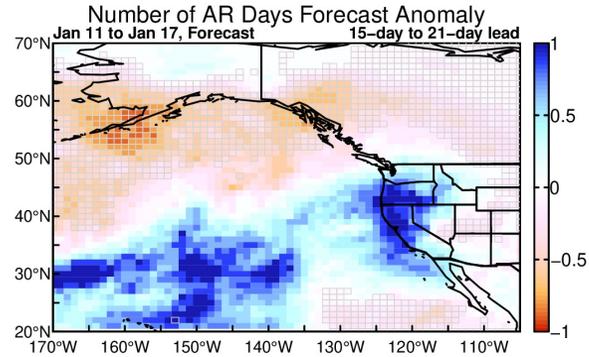
# Summary

- **Week 2 forecasts (1–7 Feb):** Models disagree on the likelihood of landfalling AR activity over western North America
  - NCEP is showing moderate probabilities (40–70%) of AR activity over British Columbia and Washington
  - ECMWF is showing much lower probabilities (< 30%) of AR activity in these areas
  - Both models are showing low probabilities (< 30%) of AR activity over California
- **Week 3 forecasts (8–14 Feb):** Models agree on general pattern of AR activity, but disagree on the magnitude of the anomalies
  - Above-normal AR activity over British Columbia; below-normal AR activity along the California coast
  - Anomaly signals are much stronger in NCEP than in ECMWF
- Current forecasts suggest that persistent ridging near the US West Coast is unlikely during the next several weeks
- The lack of persistent ridging in the forecasts suggests that there may be opportunities for storms to bring precipitation to California over the next several weeks

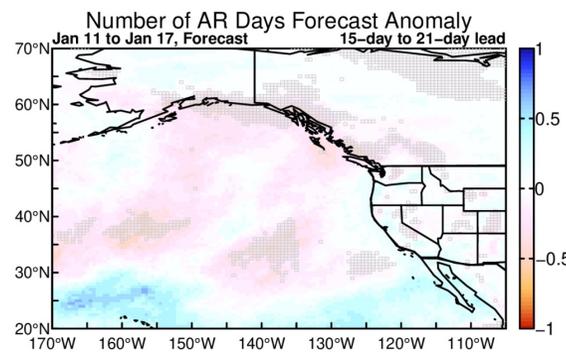
# Looking Back: Week 3 AR Activity Forecasts

Valid: 11–17 Jan 2022

NCEP Experimental Forecast Initialized: Dec 27, 2021



ECMWF Experimental Forecast Initialized: Dec 27, 2021

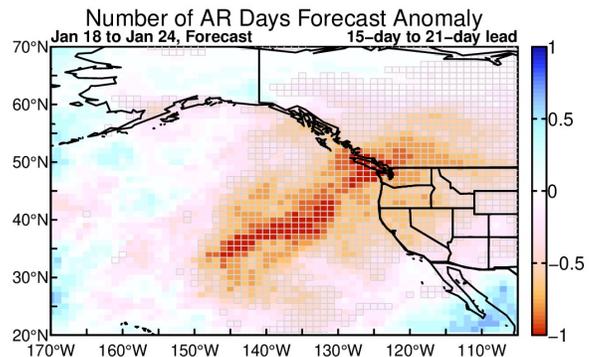


- NCEP: Above-normal AR activity over California and Oregon

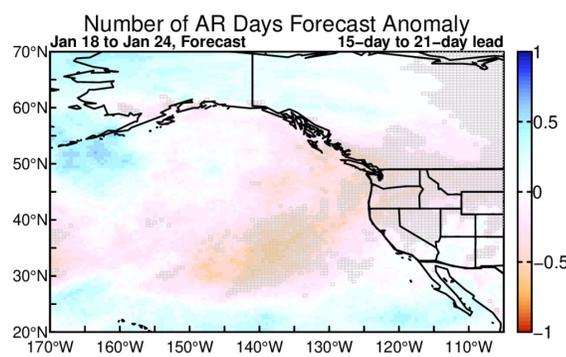
- ECMWF: Near-normal AR activity along the US West Coast

Valid: 18–24 Jan 2022

NCEP Experimental Forecast Initialized: Jan 03, 2022



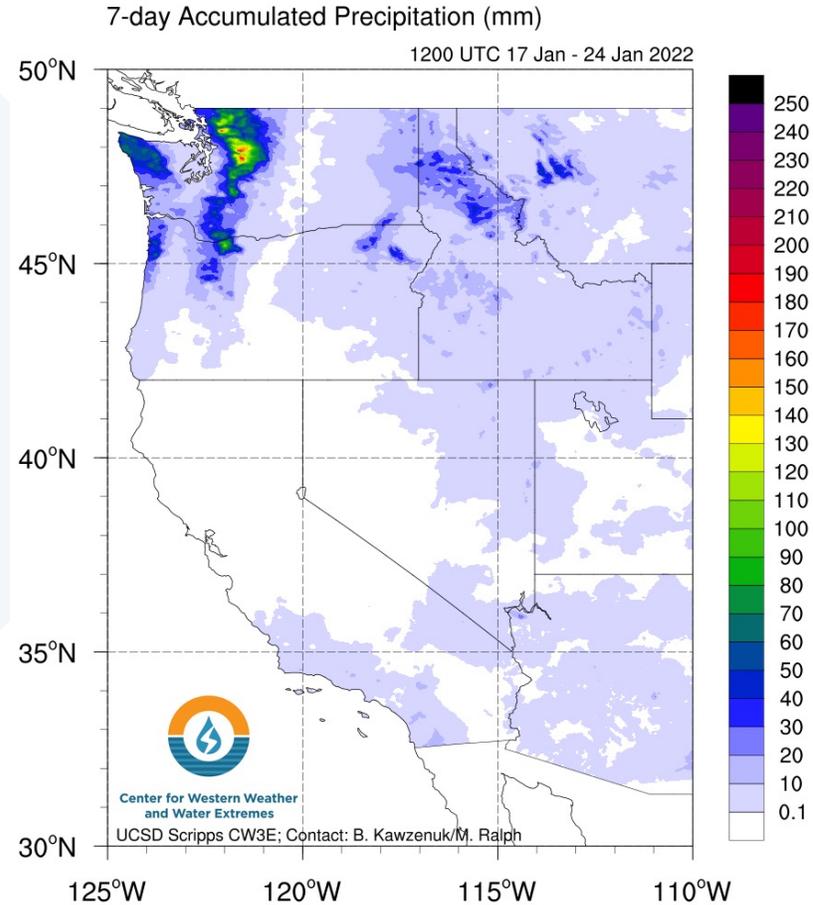
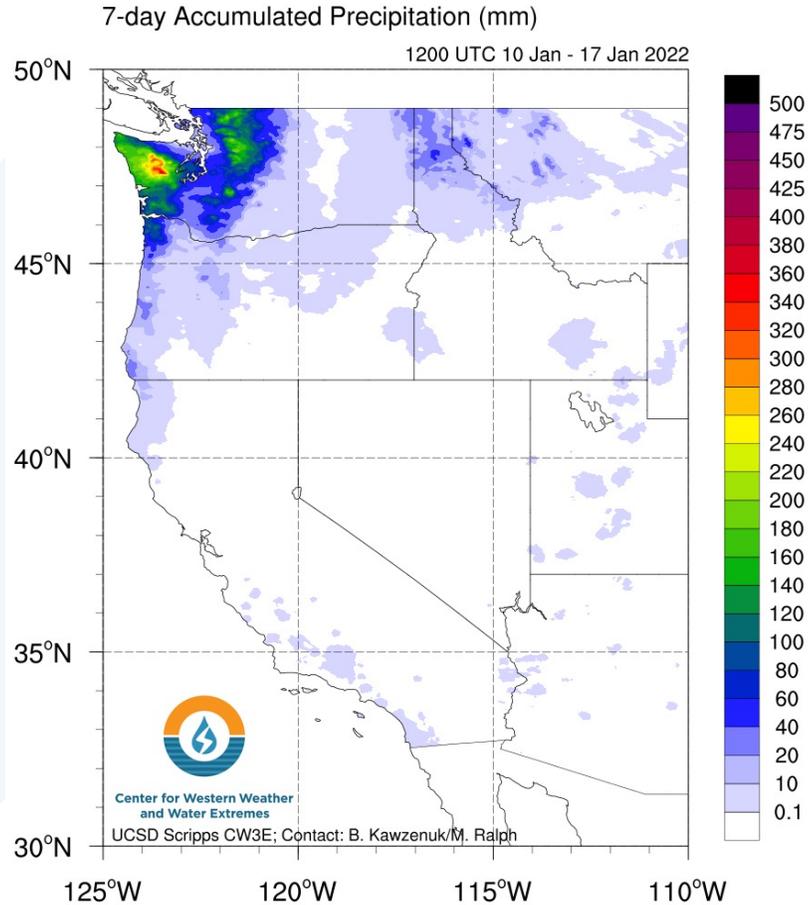
ECMWF Experimental Forecast Initialized: Jan 03, 2022



- NCEP: Below-normal AR activity over western North America, especially southern British Columbia and Washington

- ECMWF: Slightly below-normal AR activity over western North America

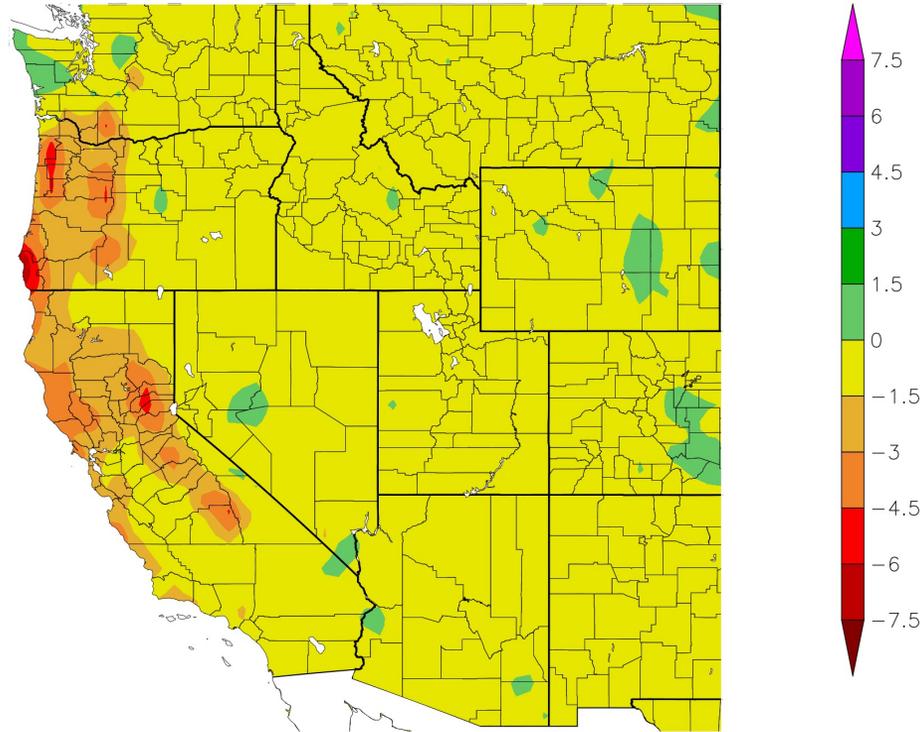
# Looking Back: Accumulated Precipitation (10–24 Jan)



- An AR and an associated low-pressure system brought heavy precipitation to the Olympic Peninsula and North Cascades during 10–13 Jan
- A weak cold front associated with a low-pressure system in the Gulf of Alaska produced additional precipitation in the Washington Cascades during 20–21 Jan
- Dry conditions were generally observed elsewhere in the western US during the previous two weeks

# Looking Back: 14-day Precipitation Anomaly (6–20 Dec)

Departure from Normal Precipitation (in)  
1/11/2022 – 1/24/2022

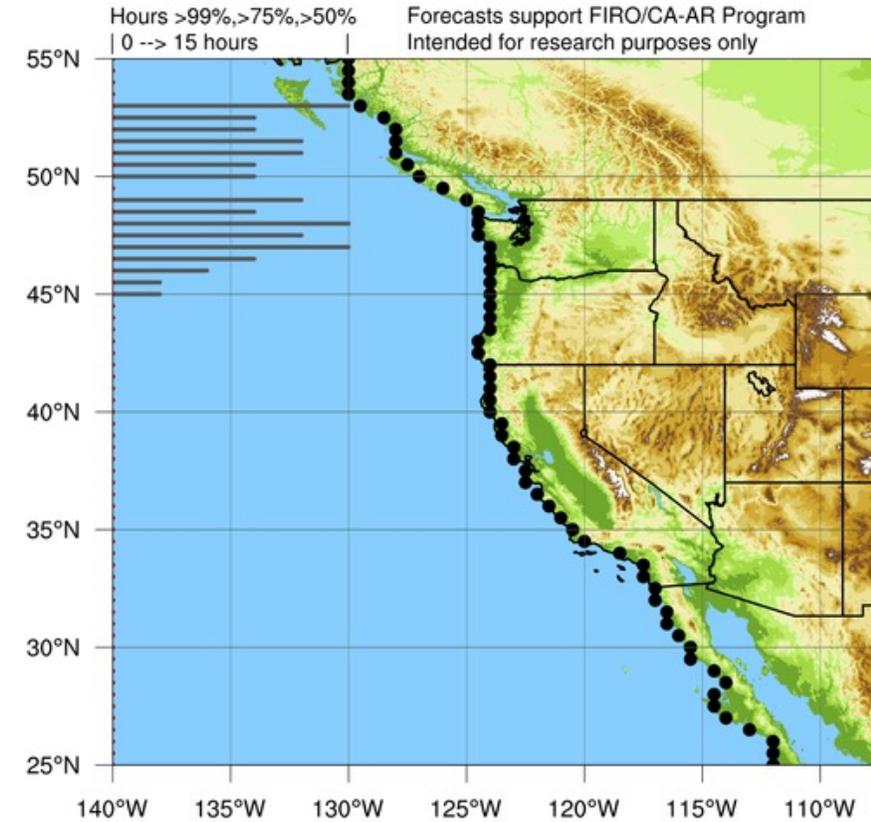
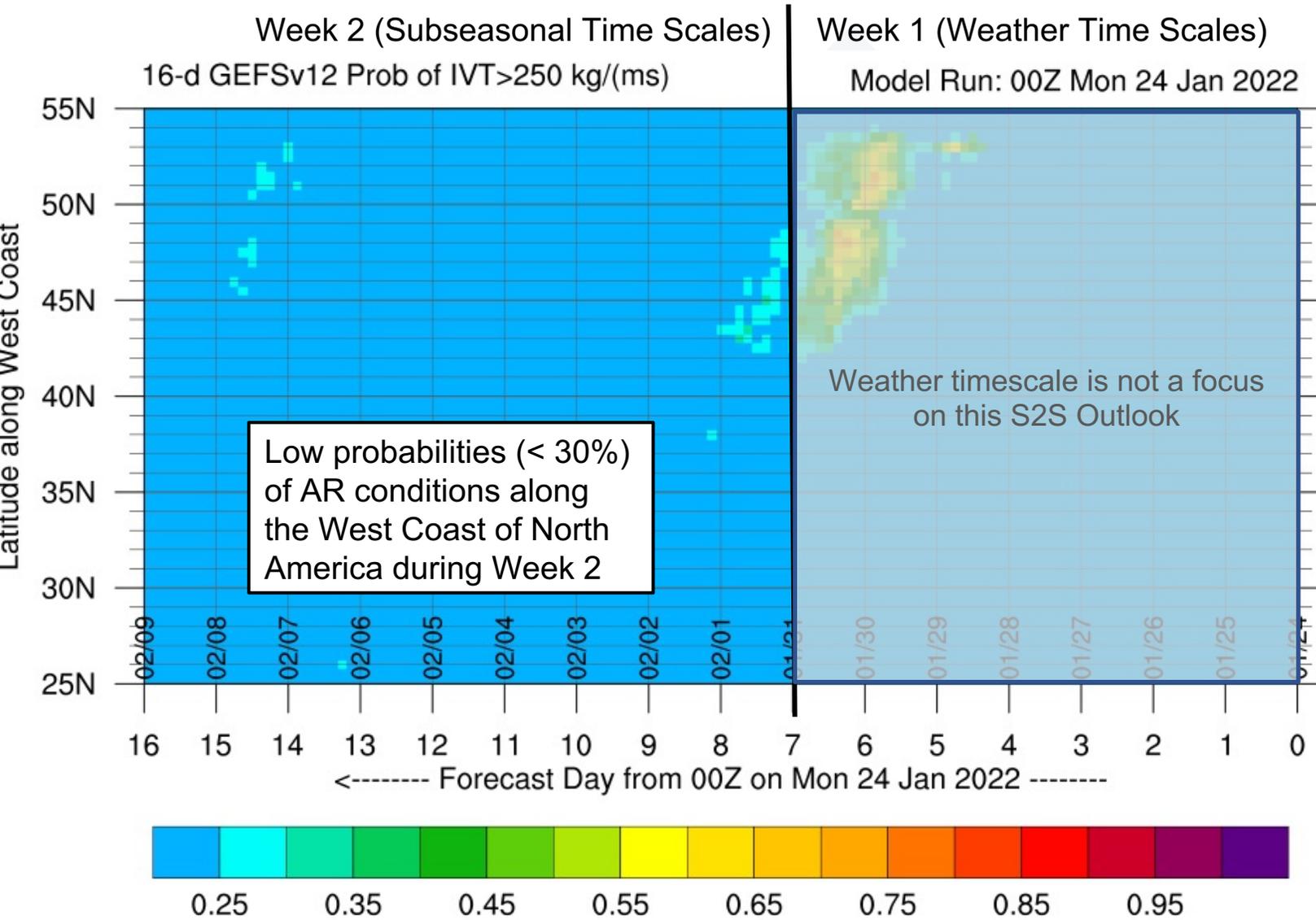


- Abnormally dry conditions in western Oregon, the California Coast Ranges, and the Sierra Nevada
- Near-normal precipitation in western Washington

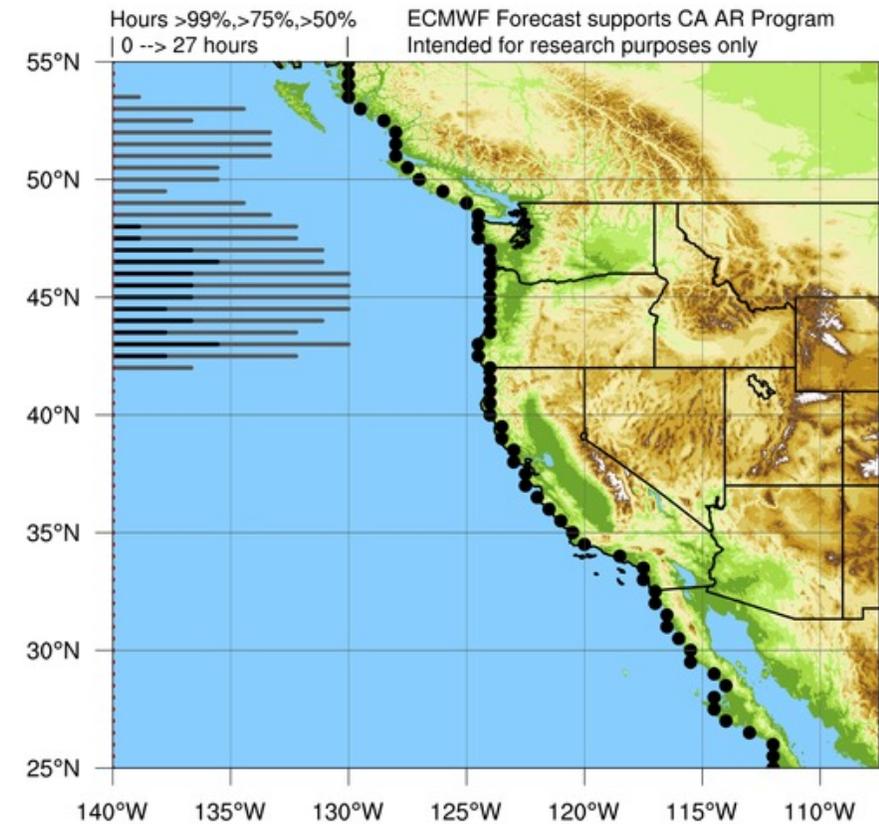
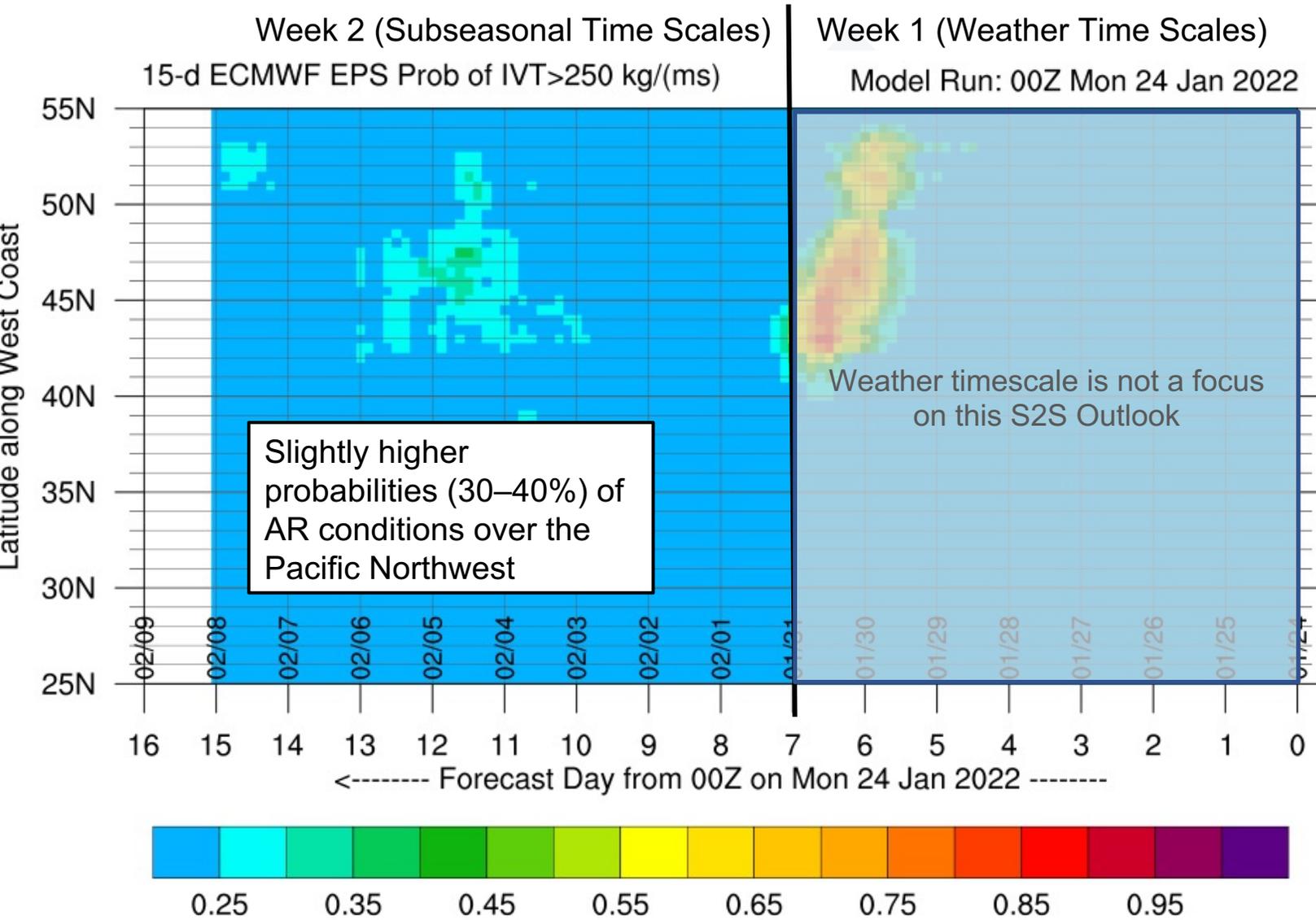
Generated 1/25/2022 at HPRCC using provisional data.

NOAA Regional Climate Centers

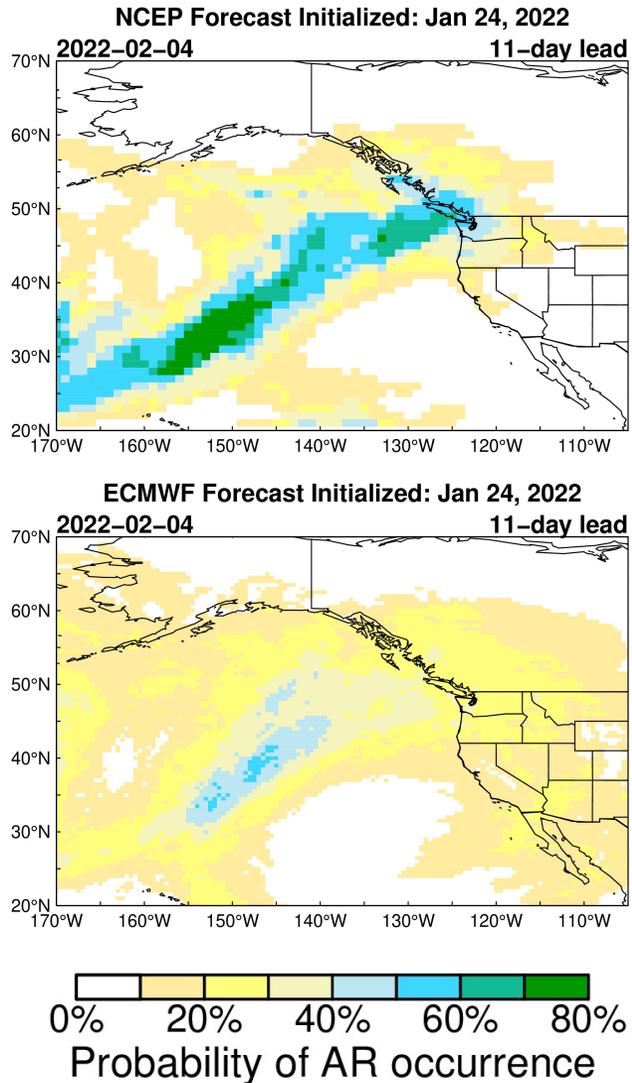
# GEFS AR Landfall Tool: Valid 00Z 24 Jan – 9 Feb



# ECMWF EPS AR Landfall Tool: Valid 00Z 24 Jan – 8 Feb



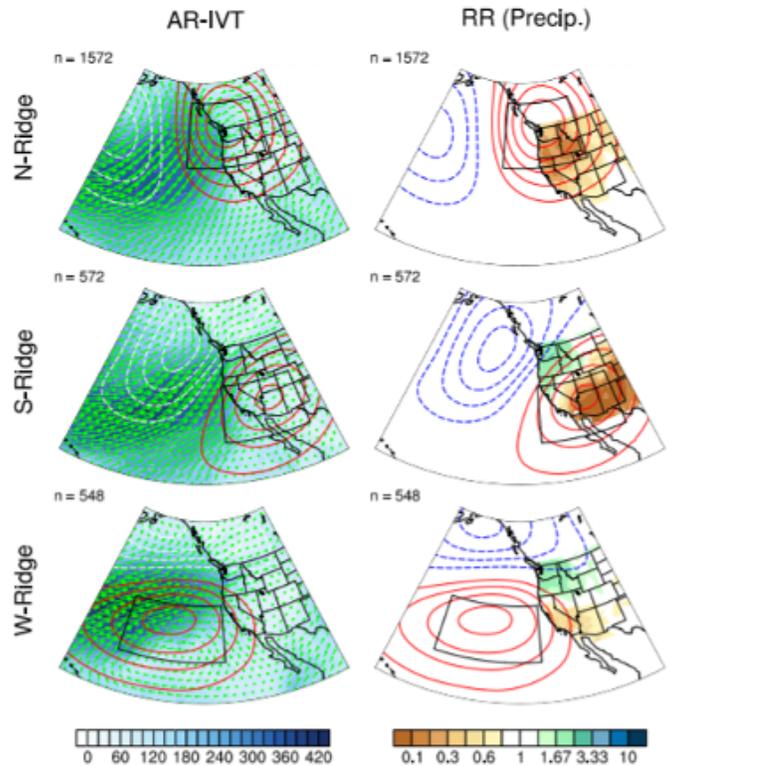
# Subseasonal Outlooks: Week 2 AR Activity (NCEP vs. ECMWF)



- NCEP model is showing moderate probabilities (40–70%) of AR activity over British Columbia and Washington, and very low probabilities (< 20%) of AR activity over the southwestern US on 4 Feb
- ECMWF model is showing much lower probabilities (< 30%) of AR activity over British Columbia and Washington, and slightly higher probabilities (> 20%) of AR activity over the southwestern US

NCEP model is showing higher forecast confidence in AR conditions over British Columbia and Washington during Week 2

# Subseasonal Outlooks: Weeks 1–2 Ridging Forecasts (NCEP)

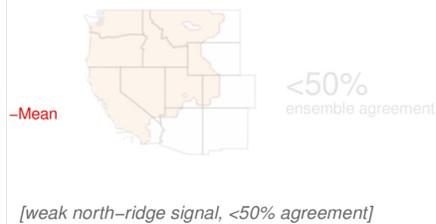


## How each ridge type typically influences precipitation

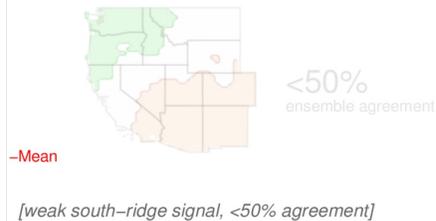
**Left:** Maps showing the average influence of each ridge type (red contours) on integrated vapor transport (IVT, blue shading indicates greater moisture transport, arrows indicate direction) during atmospheric river events

**Right:** Maps showing the 'Relative Risk' (RR) of precipitation under each ridge type. Brown shading indicates a reduced chance of precipitation when ridging occurs. For example, a RR value of 0.2 indicates a 5-fold reduction in the likelihood of precipitation

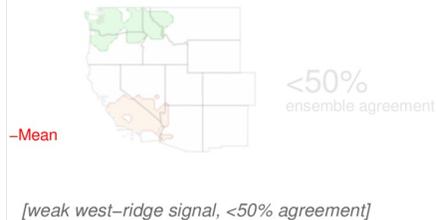
## North-Ridge



## South-Ridge



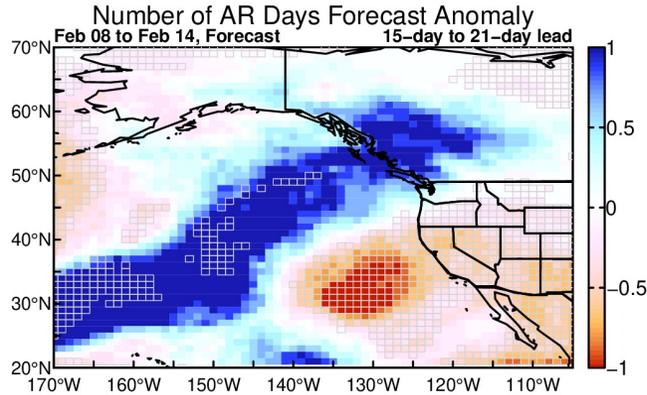
## West-Ridge



- NCEP and ECMWF (not shown) models both show low confidence (< 50% ensemble agreement) in the occurrence of persistent ridging near the US West Coast during Weeks 1–2 (24 Jan – 7 Feb)

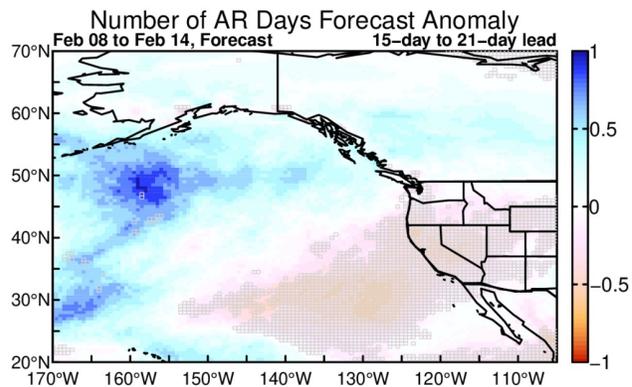
# Subseasonal Outlooks: Week 3 AR Activity (NCEP vs. ECMWF)

NCEP Experimental Forecast Initialized: Jan 24, 2022



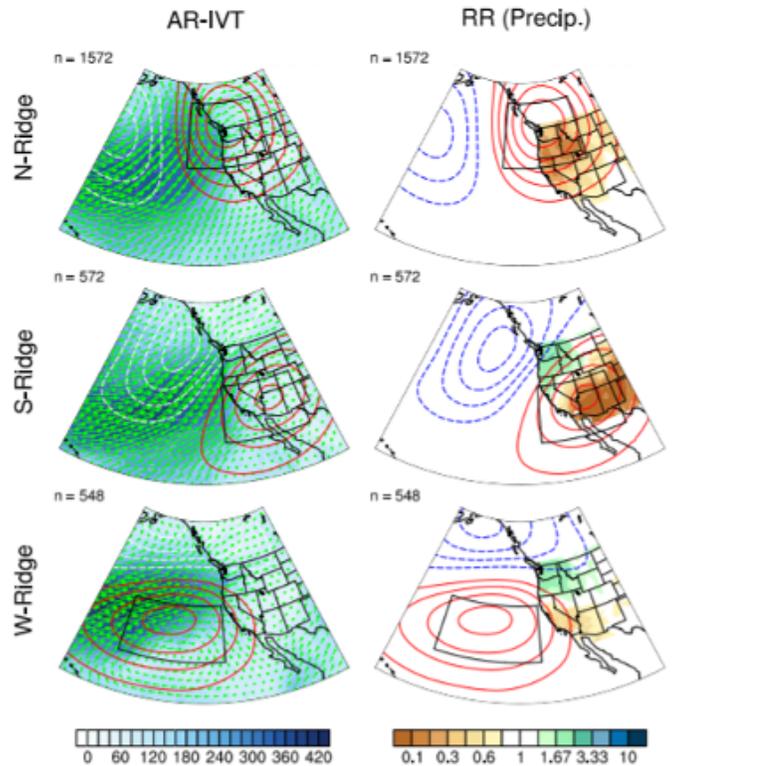
- NCEP model is predicting significantly below-normal AR activity west of California and significantly above-normal AR activity over British Columbia during Week 3 (8–14 Feb)
- ECMWF model is predicting a similar pattern of AR activity, but the anomaly signals are much weaker

ECMWF Experimental Forecast Initialized: Jan 24, 2022



Both models are showing a north–south dipole pattern in AR activity along the coast of North America, with below-normal AR activity around 30–40°N, and above-normal AR activity around 50–60°N. However, there is disagreement on the magnitude of the anomalies.

# Subseasonal Outlooks: Weeks 3–4 Ridging Forecasts (NCEP)

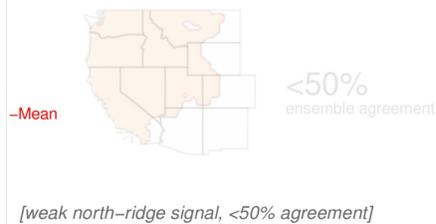


## How each ridge type typically influences precipitation

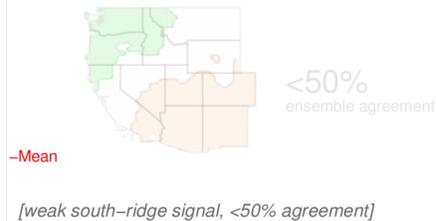
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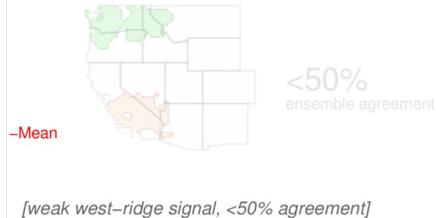
## North-Ridge



## South-Ridge



## West-Ridge



- NCEP and ECMWF (not shown) models both show low confidence (< 50% ensemble agreement) in the occurrence of persistent ridging near the US West Coast during Weeks 3–4 (7–21 Feb)

There is low confidence overall in persistent ridging during the next several weeks